

Notice of Allowability

Application No.

10/697,768

Applicant(s)

THALER ET AL.

Examiner

Art Unit

Henry S. Hu

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to IDS/RCE of September 23, 2006.
2. ☒ The allowed claim(s) is/are 1-42.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date 9-23-2005
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

1. Applicants' RCE and new IDS filed on September 23, 2005 were both received. The examiner has considered all the eight USPG-PUB references as specified in the IDS. **It is noted that the Applicants have NOT paid issue fee as today.** Claims 1-42 are pending now with only one independent claim (Claim 1). An action follows.

Allowable Subject Matter

2. Claims 1-42 are allowed.

3. The following is an examiner's statement of reasons for allowance: The above claims 1-42 are allowed over the closest references:

4. *The limitation of amended parent Claim 1 of present invention relates to a method of aqueous emulsion polymerization of two or more fluoromonomers comprising the steps of: (1) forming a pre-emulsion by mixing $CF_2=CF-R^1-SO_2X$ with R^1 and X as specified and with 0.001-0.9 molar equivalents of a base, in the absence of added emulsifier; and (2) reacting said pre-emulsion with one or more perfluorinated comonomers in the absence of added emulsifier, said comonomers being perfluorinated, so as to form a fluoropolymer latex comprising a*

*fluoropolymer wherein more than 1 mol% of monomer units are derived from $CF_2=CF-R^1-SO_2X$. See other limitations of dependent **Claims 2-42**.*

5. The previous Notice of Allowance filed on August 22, 2005 is now incorporated here by reference. In a close examination on the prior art as mentioned on the newly submitted IDS filed on September 23, 2005 along with a further examination and search, the examiner has found the following prior art did not teach the claimed limitation:

As discussed earlier, parent **Claim 1** is related to a method of aqueous emulsion polymerization comprising two continuous steps as: (1) first **forming a pre-emulsion** by mixing $CF_2=CF-R^1-SO_2X$ with **0.001-0.9 molar equivalents of a base** in the absence of added emulsifier, and (2) then reacting said a pre-emulsion with one or more **perfluorinated** comonomer(s) without adding emulsifier to form a latex. Additionally, the resultant copolymers in the latex is required to contain **more than 1 mol%** of monomer units **derived** from $CF_2=CF-R^1-SO_2X$. It is noted that **unexpected results** were found by the Applicants as shown on page **11** of Remarks by using **partially hydrolyzed $CF_2=CF-R^1-SO_2X$** (in which it contains unhydrolyzed monomer of $CF_2=CF-R^1-SO_2X$) as well as without added surfactant to obtain perfluorinated copolymers more easily melt processed by extrusion or compression into film or membranes.

6. **Four** USPG-PUBs in this new IDS **do** disclose prepare **pre-emulsion** of a specific $CF_2=CF-R^1-SO_2X$ type monomer such as **MV4S** ($CF_2=CF-O-CF_2CF_2CF-SO_2F$) in water.

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However, it is prepared in the presence of a fluorinated emulsifier of ammonium perfluorooctanoate) so as to be used in the copolymerization with other fluorinated monomer(s) such as TFE. Therefore, such a pre-emulsion preparation is quite different from the claimed procedure, which **forms a pre-emulsion by mixing $\text{CF}_2=\text{CF}-\text{R}^1-\text{SO}_2\text{X}$ with 0.001-0.9 molar equivalents of a base "in the absence of added emulsifier"**. Additionally, the pre-emulsion is not for use in co-polymerization. Such four US PG-PUBs include (A) **2005/0107532 A1 to Guerra** (see paragraph 0032), (B) **2005/0107488 A1 to Yandrasits** et al. (see paragraph 48), (C) **2005/0107490 A1 to Yandrasits** et al. (see paragraph 0050) and (D) **2005/0131097 A1 to Jing** et al. (see paragraph 0051).

The other **four** USPG-PUBs in this new IDS **do not disclose prepare any pre-emulsion of $\text{CF}_2=\text{CF}-\text{R}^1-\text{SO}_2\text{X}$ monomer by the addition of a base so as to be used in co-polymerization.** They are actually dealing with crosslinking reaction on sulfonyl halide pendant group-containing fluoropolymer (see abstract and EAST search). Such four US PG-PUBs include (A) **2005/0107489 A1 to Yandrasits** et al., (B) **2005/0113528 A1 to Jing** et al., (C) **2005/0131096 A1 to Jing** et al. and (D) **2005/0137351 A1 to Guerra**.

7. In order to distinguish such a critical difference in preparing pre-emulsion of $\text{CF}_2=\text{CF}-\text{R}^1-\text{SO}_2\text{X}$ monomer with a base **in less than one equivalent amount but without adding emulsifier**, the present invention has shown in examples along with some comparative examples for making such a perfluorinated copolymer with **partially hydrolyzed $\text{CF}_2=\text{CF}-\text{R}^1-\text{SO}_2\text{X}$** (see pages 10-14 for **examples 1-2 and comparative example 3C**). Therefore, all the above-

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mentioned references, in combination or alone, does not teach or fairly suggest the limitations of present invention.

In summary, the above **eight** IDS reference and the references mentioned before, in combination or alone, fails to teach or fairly suggest the limitations of present invention.

8. After further examination and search, the examiner found the following prior art did not teach the claimed limitation:

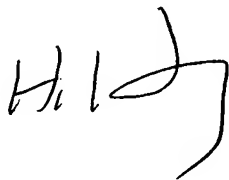
US Patent No. 5,852,148 to Behr et al. only disclose the process to prepare a pre-emulsion of some fluorinated polymer such as a fluorichemical oligomeric urethane. However, it is prepared in the presence of an emulsifier such as “**Huels**”. Therefore, such a pre-emulsion preparation is quite different from the claimed procedure, which **forms a pre-emulsion by mixing $\text{CF}_2=\text{CF}-\text{R}^1-\text{SO}_2\text{X}$ with 0.001-0.9 molar equivalents of a base “in the absence of added emulsifier”**. Additionally, the pre-emulsion is not for use in co-polymerization. Therefore, Behr et al. fail to teach or fairly suggest the limitation of present invention.

9. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu** whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The **fax** number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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February 3, 2006



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